



Journal of Epidemiology and Global Health

ISSN (Online): 2210-6014

ISSN (Print): 2210-6006

Journal Home Page: <https://www.atlantispress.com/journals/jegh>

A 360-degree view of an ancient killer disease

Sarah E. Ahlbrand, Madhukar Pai

To cite this article: Sarah E. Ahlbrand, Madhukar Pai (2017) A 360-degree view of an ancient killer disease, Journal of Epidemiology and Global Health 7:4, 209–210, DOI: <https://doi.org/10.1016/j.jegh.2017.10.003>

To link to this article: <https://doi.org/10.1016/j.jegh.2017.10.003>

Published online: 16 April 2019



Editorial

A 360-degree view of an ancient killer disease



Tuberculosis is a disease that most people have heard of but disregard as a major global health concern. The severity of tuberculosis is often overshadowed by other infectious diseases, leading to the common belief that tuberculosis is an issue of the past. In reality, this could not be further from the truth. Causing more than 1.8 million deaths annually, tuberculosis currently ranks first as the number one cause of mortality due to an infectious agent worldwide [1]. Compounded by the emergence of multidrug-resistant tuberculosis strains, raising awareness of this disease is now very critical. In “Catching Breath: The Making and Unmaking of Tuberculosis”, Kathryn Loughheed has brought tuberculosis back to the forefront in the battle against infectious diseases [2].

Loughheed is a microbiologist-turned-science writer currently residing in UK. Prior to her writing career, she spent many years conducting research on *Mycobacterium tuberculosis* (MTB). In this book, Loughheed utilizes both her expertise as a tuberculosis researcher and science communicator to describe the story of MTB through the ages, from its evolutionary origins in hunter-gatherers to the present day. In addition to providing a historical walkthrough, Loughheed also discusses new research findings, patient perspectives, public health challenges, and therapeutic strategies moving forward. The book truly offers a 360-degree perspective of tuberculosis.

The book begins with a historical run-down of tuberculosis disease and the co-evolutionary history of MTB with humans. Loughheed discusses the evolution and divergence of tuberculosis that likely occurred tens of thousands of years ago and possibly affected early hominids, followed by the devastating epidemics of the 19th and early 20th centuries. The book does a spectacular job of showing how MTB shaped the history of humanity, and how humans, in turn, forced the pathogen to evolve. For example, it is quite remarkable that over 90% of those infected with MTB are able to avoid the active form of the disease and develop immunological responses to keep the bacteria in a “latent” state [3].

Mycobacteria, in turn, have evolved to develop a lipid-rich and hardy cell wall, a slow rate of replication, and an intracellular, phagosomal niche to reside in. Loughheed then segues into how these characteristics make tuberculosis treatment notoriously difficult and discusses the challenges associated with discovering novel therapeutics and designing better diagnostic tools. Throughout the book, Loughheed is also very transparent with regard to discussing the hurdles and shortcomings associated with drug

and diagnostic development while also still highlighting the progress and recent successes in the field.

Another notable highlight of “Catching Breath” is that Loughheed not only includes her own personal insights from her years of working with MTB in the lab but also goes above and beyond to incorporate knowledge and perspectives from a myriad of other tuberculosis experts. As a newly minted PhD who studied MTB host/pathogen interactions, I (SEA) was delighted when I came across quotes from so many familiar names in the tuberculosis field, many of which I have only known through seeing their names heading primary research articles on PubMed. As a more established tuberculosis researcher (MP), I could recognize some of our research cited in the book, but do wish the book had a section on references and footnotes. Also, inclusion of images and illustrations would have enhanced the value of this book. Nevertheless, Loughheed did her homework to seek expertise outside her own knowledge base, making the book much more impressive and compelling.

Loughheed also does a spectacular job in writing the book in a way that can be understood and enjoyed by a wide variety of audiences, whether you are a non-scientist who is simply interested in infectious diseases or a professor who has been researching tuberculosis for decades. She does not skimp or “dumb down” complex concepts or terminology. Rather, she uses beautiful and effective analogies to illustrate these topics in a manner that is comprehensible to a layperson, yet still fun to read for those who are more scientifically-oriented.

One of our favorite examples is when she describes the thickness of the MTB cell wall. “If *M. tuberculosis* were a person, its outer coating would be around 6 cm (2½ inches) thick”, she describes. She then continues to provide a visual description of what this would look like in actuality, stating, “Imagine coating your entire body in a 6-cm thick layer of solid butter and liquid margarine, imbedded with lumps of protein and sugary cake sprinkles. Congratulations, you are now looking not very like a mycobacterial cell, but you are quite delicious.” For those interested in communicating biomedical science-related topics to the general public, take note—this is how you do it!

Perhaps most importantly, Loughheed drives the point home that tuberculosis researchers must have an interdisciplinary understanding of this illness, from the molecular biology of the bacterium to socioeconomic and global health impacts. Even as tuberculosis researchers, it is easy to forget that MTB has single-handedly ruined millions, if not billions of lives during its evolutionary history. It is important that we as researchers take a step

back and ponder over what those numbers actually mean. Loughheed reminds us of this bigger picture by sharing personal stories from tuberculosis patients and survivors, many of whom still feel the damage and impact of their illness long after they were released from the hospital [4]. She also highlights the socioeconomic impacts of the disease, including the social stigma that accompanies being labeled as a tuberculosis patient.

Since the time I (SEA) first entered the tuberculosis research field, I have been trying to find a book that encompasses not only the history and socioeconomic impacts of tuberculosis but also incorporates our current knowledge about recent advancements in science. As someone who mentors students working in tuberculosis, I (MP) have been looking for a book which can serve as required reading for all students joining my lab. Without a doubt, “Catching Breath” exceeds all our expectations, and we cannot recommend this book enough for learning about the history, current research, and challenges regarding this disease.

Loughheed’s mix of engaging, humorous storytelling, and colorful, descriptive language brings the bacterium to life in a way that cannot be captured simply by textbooks, Wikipedia pages, or primary research articles. For this being Loughheed’s first book, she does an extraordinary job at engaging her readers to drive the point home that for being *just* a bacterium, MTB knows more about the immune system than we ever will, even with all our fancy next-generation methodology and equipment. We highly recommend this book for anybody interested in the field of infectious diseases and eagerly look forward to reading more of Loughheed’s work in the future.

Conflicts of interest

None.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.jegh.2017.10.003>.

References

- [1] World Health Organization. Global Tuberculosis Report 2016. Geneva: WHO; 2016.
- [2] Loughheed K. *Catching breath—the making and unmaking of tuberculosis*. London: Bloombury Sigma; 2017. ISBN 9781472930330.
- [3] Pai M, Behr M, Dowdy D, Dheda K, Divangahi M, Boehme C, et al. Tuberculosis. *Nat Rev Dis Primers* 2016;2:1–23.
- [4] Chavan D. Fighting TB requires empowered patients. *BMJ* 2017;356:i6344.

Sarah E. Ahlbrand

Technical Resources International, Bethesda, MD, USA

Madhukar Pai*

McGill International Tuberculosis Centre, McGill Global Health Programs, McGill University, Montreal, Canada

Manipal McGill Centre for Infectious Diseases, Manipal University, Manipal, India

* Address: McGill University, Department of Epidemiology & Biostatistics, 1020 Pine Ave West, Montreal, QC H3A 1A2, Canada.

E-mail address: madhukar.pai@mcgill.ca

Received 25 September 2017

Accepted 3 October 2017

Available online 7 October 2017